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DEVELOPMENT OF AN IMAGE ROTARY ENCODER FOR MOTION CONTROL

ISMAYUZRI BIN ISHAK

Thesis submitted in fulfillment of the requirements  
for the award of the degree of  
Master of Engineering in Manufacturing

Faculty of Manufacturing Engineering  
UNIVERSITI MALAYSIA PAHANG

APRIL 2013

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## LIST OF SYMBOLS

$m_{p,q}$	Contour moment
$\theta$	Angle
$\omega_{\max}$	Maximum speed (RPM)
$T_{pt}$	Processing time
$K_p$	Proportional gain constant
$K_i$	Integral gain constant
$K_d$	Derivative gain constant
$K_{pu}$	Critical gain constant
$T_r$	Rise time
$T_p$	Peak time
$T_s$	Settling time
$T_u$	Period of time for $K_{pu}$
$r$	Coefficient of correlation

## LIST OF ABBREVIATIONS

ADC	Analog to Digital Converter
BPC	Binary Position Code
CAD	Computer Aided Design
CCD	Charged Coupled Device
CMOS	Complementary Metal Oxide Semiconductor
COG	Centre of Gravity
CTE	Coefficient of Thermal Expansion
DAC	Digital to Analog Converter
DC	Direct Current
DSP	Digital Signal Processing
EPP	Enhanced Parallel Port
LabVIEW	Laboratory Virtual Instrument Engineering Workbench
LED	Light Emitting Diode
NI	National Instruments
OS	Operating System
PID	Proportional, Integral and Derivative
RPM	Revolution per Minute
USB	Universal Serial Bus
ZN	Ziegler-Nichols